Technical Disclosure Commons

Defensive Publications Series

March 2021

AIR PRESSURE SYSTEM ASSISTED PRIME FROM INK PUMP

HP INC

Air Pressure System assisted prime from ink pump

The purge process of the Ink Delivery System (IDS) of a printer is a critical process from several points of view.

It is one of the process of the Out of the Box Experience, it is the first contact of the customer with the printer that has just been bought. And the first time the printer starts moving ink. So, any problem related to the purge has a huge impact on customer experience.

Any problem during this process can lead to broken components and a leakage, dirtying the new printer.

Also, a problem during the purge process can lead to air bubbles inside the tubes, with huge impact on image quality and printhead life (and the related costs for the customer or for warranty).

This invention disclosure describes the process that a service engineer can implement to avoid a situation at which an ink pump cannot do the self-prime itself during the purge process, preventing from having to change the component and implementing a fast and reliable solution in the field.

The purge process is part of the Out of the Box experience, with huge impact on customer experience.

During the purge from the printer, some pumps have difficulties of priming, which results in uncompleted start up process. This prevents the customer from using the printer and requires technical intervention. This invention disclosure describes a process that can prevent most of the failures of pumps during this process by doing the pump prime when the pump cannot execute the self-prime correctly.

It also prevents the pump from working a lot of time without a load, that can end up with a broken component.

This invention defines a process that allows a service engineer to prime the pump during the purge process if the pump cannot do the prime itself.

Some of the IDS hardware architecture include an Air Pressure System. These systems are known as Hot-Swap because they allow the customer to keep printing while changing the ink supplies. Thus, the system must consist in a supply, a pump, a pressure sensor, and an Air Pressure System (APS).

This invention consists in connecting a tube from the aspiration of the air pump to the output of the ink pump. This tube consists in:

- Needle to connect tube to FI tower from printer
- Tube
- Purger foam

This tube will be connected to the FI tower from the ink line through a needle and the other end to the aspiration port from the air pump.

If during the purge process, a customer checks the purgers and there's any ink line unable to perform the purge, the tube can be connected to the FI tower from the line. Then, triggering the APS assisted retry, the aspiration of the air pump will create a depression such as to suction ink from the supply and performing the prime from the ink pump. Once the ink reaches the tube, a foam inside can prevent the ink from reaching the air pump. This foam expands when is in contact with a fluid, preventing the fluid from passing through it.

If the air pump technology doesn't allow to operate safely in vacuum condition during a certain time, a relief valve can be included in the disposal tube to crack before any dangerous pressure is achieved.

Once the purge is successfully completed, the tube can be removed, and the printer can operate regularly.

There are a lot of advantages of being able to prime the pump with this process when the self-prime fails. The main ones are:

- Providing a solution to the service engineer or the customer in the field if a pump would not self-prime correctly.
- Reduce cost from extra components like syringes in the OOB material.
- Customer experience would be improved by reducing hard repairs and interventions during the purge.
- Reduce warranty costs related to the ink pump.

- It is a flexible solution, that does not depend on the program. It can be used in all Hot Swaps programs that have an APS.

Disclosed by Oscar Gomez Camps, Cristian Diez Quilez and Josep Maria Bel Calavia